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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JULY 1987

GLASS: The Hot New Package

Top 50 'Giants' In Packaging

Recycling Saves $500,000 A Year

How To Reduce Pouch Problems

New Packages For Microwaving

Nut Co. Improves Vacuum Packing

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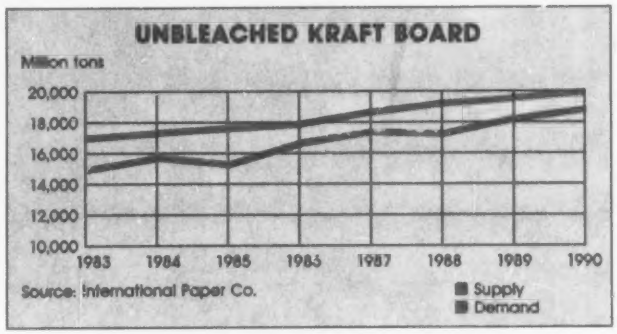
KRAFT BOARD USAGE TO GROW THROUGH 1988

Decline of dollar to keep exports strong

Containerboard consumption in the United States will increase by about 2.5 per cent in 1987 and by slightly less than that in 1988, according to a report by International Paper Co. The decline of the dollar should keep exports fairly strong.

The operating rate for linerboard in 1987 is likely to remain in the middle to high 90s, the report said.

Little new capacity is coming on elsewhere in the world. Most of that is a result of additions to existing machines.



SHIPMENTS OF CANS FOR SOFT DRINKS, BEER RISE

Profitability seen as one major factor

Metal cans for soft drinks and beer maintained their record of per centage increases in shipments throughout 1986 according to the Can Manufacturers Institute, Washington, D.C.

Soft-drink can shipments grew 6.6 per cent to 36.8 billion units, pushing their share of total soft-drink gallonage above the 40 per cent mark for the first time. Total shipments of beer cans grew by 1.2 per cent to 36.1 billion units during the year, bringing the can share of total beer barrelage to 70 per cent.

Michael Dunn, president of the Can Manufacturers Institute, credited seven key factors: bottler profitability, growth in vending, multipacking, retailer profitability, consumer demand, packaging quality, and recyclability.

Dunn said, "Metal cans continue to be, by far, the soft-drink and beer industry's most profitable package. They're outperforming glass and plastic bottles in every arena—production, distribution, and margin contribution."

AEROSOL PRODUCTION RISES FOR FOURTH YEAR

Personal products remain largest category

Aerosol production rose by 5 per cent in 1986—the fourth consecutive year in which the industry has seen real growth in units.

According to recent estimates by the Chemical Specialties Manufacturers Association, slightly more than 2.5 billion aerosol containers units were filled in 1985 and more than 2.6 billion were filled last year.

Personal products remain the largest category of aerosols, the survey noted, accounting for more than 36 per cent of total containers filled.

PACKAGING LEADTIMES (in weeks)

	May. '87	April '87	May '86
Metal cans	3.8	3.3	3.3
Composite cans	3.2	3.2	3.1
Glass containers	4.8	3.8	4.2
Plastic bottles	4.0	3.8	3.2
Plastic film	3.7	3.8	3.6
Laminates	4.4	4.3	3.9
Corrugated containers	3.4	3.2	2.9
Multiwall bags	4.5	3.8	3.7
Kraft paper	3.5	3.4	2.5
Folding cartons	4.2	3.7	4.0
Fiber drums	3.3	3.2	2.9
Industrial crates	3.6	3.2	3.2
Strapping	3.2	3.2	2.7
Steel drums (shipping)	3.3	3.2	2.9
Pallets	2.6	2.5	2.6

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES ($/lb.)

	May '87	April '87	May '86
Aluminum can stock ($/lb.)	1.00	1.00	.95
LDPE/liner($/lb.)	.33	.31	.30
LDPE/clarity($/lb.)	.34	.34	.34
LLDPE/butene($/lb.)	.32	.30	.28
LLDPE/octene($/lb.)	.36	.36	.33
HDPE/blow molding($/lb.)	.34	.33	.32
HDPE/film grade($/lb.)	.36	.35	.35
Polystyrene/general purpose($/lb.)	.58	.46	.32
Polystyrene/impact($/lb.)	.55	.49	.34
PVC/general purpose($/lb.)	.33	.33	.31
PP/homopolymer($/lb.)	.38	.38	.34
PP/copolymer($/lb.)	.48	.48	.44
ABS($/lb.)	1.07	1.06	.98
Unbleached kraft/shipping sack($/ton)	460	460	400
Unbleached kraft/grocery sack($/ton)	400	400	330
Linerboard, 42 lb. east($/ton)	350	350	280
Linerboard, 42 lb., west($/ton)	350	350	285
Corrugated med., semichemical($/ton)	320	320	260
Recycled folding boxboard, clay coated($/ton)	400	400	375
Recycled folding boxbd., chipbd.($/ton)	310	310	290
Bleached kraft, folding carton($/ton)	630	630	565

Source: Purchasing, a Cahners publication

RAPID GROWTH SEEN FOR SINGLE-SERVE PACKAGING

Plastics expected to be a star performer

At present, according to a study by Business Communications Co., $11.1 billion worth of single-serve containers are used each year in the United States. By 1991, the study said, that figure will increase to $12.4 billion.

Reasons seen by the researchers for this rapid growth include the continuing proliferation of convenience food outlets, the increase in the senior citizen population, and lifestyle changes which will reduce the number of large meals prepared at home.

Use of plastics in this period is expected to nearly double within the single-serve packaging industry from 16 to 31 billion units. Plastic single-serve beverage and food containers will penetrate all segments of the industry, the study said. By the end of the century, their use will extend into retort canning of meat and fish dishes and into beer cans, two areas that have proved resistant so far to the penetration of plastics.

MORE STATS . . .

Industry shipments of **corrugated and solid-fibre products** for the first quarter of 1987 were 5.3 per cent higher than those for the first quarter of 1986, said the Fibre Box Association, Chicago. Consumption of containerboard for the first quarter of 1987 was 4.4 per cent higher than that of the same period last year . . . Shipments of **coil-coated steel and aluminum** in 1986 slipped 3 per cent from 1985, according to the National Coil Coaters Association, Philadelphia. Containers and packaging uses account for 3 per cent of the coil-coated steel market and 39 per cent of the coil-coated aluminum market . . . The number of **jobs in manufacturing** will grow steadily during the next 18 months, said economists for Cahners Publishing Co., Newton, Mass. Between now and the end of 1988, said Cahners, the number will increase from 19.2 million to 20.2 million.

SPECIAL REPORT

THE TOP 50 PACKAGING GIANTS

Which companies spent the most money on packaging materials and finished containers in 1986? PACKAGING ranked the top 50 firms—they're true Giants

By Melissa Larson Senior Editor

Which U.S. firms spent the most money on domestic packaging in 1986? We set out to find out, using several sources: U.S. Department of Commerce Census of Manufacturers data, industry supplier and trade association figures, 1986 sales figures for the Fortune 500, annual report data, and a big assist from our own Cahners Research Dept. We subtracted international operations, since we were interested only in domestic spending on packaging, but included the value of any self-manufactured containers. The result is our listing of the Top 50 Giants—companies whose combined purchases made up 18.4 per cent of the total $48.3 billion packaging industry last year.

Although our Giants belong to Fortune's 500, many of America's largest companies are missing—you'll find no mention of Exxon, AT&T, or General Dynamics. General Motors and IBM are there, but fairly far down the list. Rather, our Giants are the companies which package America's most famous and beloved consumer brand names: from Budweiser to Del Monte and from Ivory to Coke.

The packaging-intensive products which make a company a Giant are the things consumers eat, drink and use every day. Things like beer, cheese, ketchup, cigarettes, soft drinks, frozen pizza, yogurt, disposable razors, light bulbs, shampoo, cold remedies, and ice cream. Well-known brand names are precious selling tools, and our Giants use packaging to capitalize on them.

Take for example Anheuser-Busch, our No. 1 Giant. Like most of the firms on the list, they're diversified—with thriving bakery operations, snack foods, theme parks and even a major league baseball team. Yet the company's major marketing thrust remains its nine beer brands. Budweiser is the best-selling beer brand in the world, and the firm's financial commitment to quality packaging—which includes self-manufacture of aluminum cans—indicates its intention to keep Bud on top.

And we expect next year's Giants figures to be even higher. If it's true that 80 per cent of all purchasing decisions are made in the retail store, then in-store shelf impact may soon be more important to brand supremacy than radio and TV advertising —and marketers' packaging purchases will reflect this.

Bakery and snack packaging, as well as their famous beer bottles and cans, make Anheuser-Busch our No. 1 Packaging Giant.

Rank	Company (location)	$ Spent on Packaging (thousands)
1	Anheuser-Busch (St. Louis, MO)	$897,470.13
	Major Brands: Budweiser, Bud Light, Busch, Michelob, Natural Light, L.A., Carlsberg, Colonial bread, Earth Grains, Roman Meal Light, Eagle Snacks	
2	Philip-Morris (New York, NY)	$806,700.77
	Major Brands: Miller beer, General Foods cereals, Jello, Maxwell House, Oscar Meyer, Entenmann's, Marlboro cigarettes	
3	Procter & Gamble (Cincinnati, OH)	$680,079.65
	Major Brands: Tide, Bounce, Downy, Cheer, Joy, Ivory, Spic and Span, Mr. Clean, Comet, Jif, Crisco, Duncan Hines, Crush, Folger's, Charmin, Pampers, Oil of Olay, Zest, Lava, Sure, Secret, Vidal Sassoon, Pantene, Crest, Gleem, Scope, Nyquil, Vicks, Pepto-Bismol	
4	Pepsico (Purchase, NY)	$574,768.00
	Major Brands: Pepsi, Mountain Dew, 7UP, Slice, Fritos, Cheetos, Doritos, Tostitos, Lays, Ruffles, O'Grady's	
5	RJR Nabisco (Winston-Salem, NC)	$568,593.00
	Major Brands: Salem, More, Now, Camel, Nabisco, Del Monte, Patio, Ortega, Fleischmann's, Blue Bonnet, Inglenook wines, Beaulieu wines, Smirnoff, Black Velvet Canadian, Harvey's Bristol Cream	
6	Coca-Cola (Atlanta, GA)	$428,394.10
	Major Brands: Coca-Cola, Tab, Sprite, Fanta, Minute Maid, Hi-C, Bacardi fruit mixers	
7	Kraft (Glenview, IL)	$381,859.31
	Major Brands: Kraft, Velveeta, Philadephia cream cheese, Miracle Whip, Lender's bagels, Tombstone pizzas, Breakstone's, Breyer's, Sealtest, Frusen Gladje, Light 'n Lively, Duracell batteries	
8	Kimberly-Clark (Dallas, TX)	$325,428.42
	Major Brands: Kleenex, Kotex, New Freedom, Huggies, Delsey, Depend	
9	Campbell Soup Co. (Camden, NJ)	$306,573.04
	Major Brands: Campbell's, Swanson's, Vlasic, Pepperidge Farm, Godiva chocolates	

Domestic packaging expenses include value of self-manufactured containers

Rank	Company (location)	$ Spent on Packaging (thousands)
10	**Sara Lee Corp.** (Chicago, IL) **Major Brands:** Sara Lee, Jimmy Dean, Hillshire Farm, Chef Pierre, Popsicle, Fudgsicle, Creamsicle, Hanes, L'eggs, Isotoner, Coach bags	$303,642.36
11	**Borden, Inc.** (New York, NY) **Major Brands:** Borden, Eagle, Meadow Gold, Lite-Line, Creamettes, Cracker-Jack, ReaLemon, Wyler's, Elmer's glue, Krylon, Rain Dance	$253,375.89
12	**H.J. Heinz** (Pittsburgh, PA) **Major Brands:** Heinz, Star-Kist, Ore-Ida, Weight Watchers, 9-Lives	$218,143.89
13	**IC Industries** (Chicago, IL) **Major Brands:** Pepsi-Cola General Bottlers, Pet Inc: Progresso, B&M, Whitman's, Old El Paso, Pet-Ritz, Downy Flake	$179,605.63
14	**Conagra** (Omaha, NB) **Major Brands:** Armour, Banquet, Country Pride, Chun King, Morton's	$175,026.75
15	**G. Heileman** (LaCrosse, WI) **Major Brands:** Old Style, Special Export, Blatz, Colt 45, Champale, Barrel 'O Fun	$163,394.21
16	**Pillsbury** (Minneapolis, MN) **Major Brands:** Pillsbury, Totino's, Jeno's, Chef Saluto, Green Giant, French's potatoes, Haagen Dazs	$156,040.30
17	**Adolph Coors** (Golden, CO) **Major Brands:** Coors, Coors Light	$150,217.60
18	**Johnson & Johnson** (New Brunswick, NJ) **Major Brands:** Johnson's, Band-Aid, StayFree, Sure & Natural, ACT oral rinse, Ortho-Novum	$136,904.40
19	**American Home Products** (New York, NY) **Major Brands:** Advil, Anacin, Dristan, Riopan Plus, Denorex, Preparation H, Chef Boy-ar-dee, Mamma Leone's, Jiffy Pop, PAM, Woolite, Easy-Off, Black Flag	$131,474.67
20	**Lever Brothers** (New York, NY) **Major Brands:** All, Wisk, Snuggle, Sun Light, Surf, Final Touch, Aim, Closeup, Imperial, Dove, Caress, Mrs. Butterworth's	$130,783.07
21	**General Electric** (Fairfield, CT) **Major Brands:** General Electric, RCA	$119,053.19
22	**Brown-Forman** (Louisville, KY) **Major Brands:** California Cooler, Jack Daniels, Korbel champagne, Canadian Mist, Southern Comfort, Early Times, Bolla, Cella, Martell cognac, Lenox china and crystal, Art Carved rings, Hartmann luggage	$111,982.01
23	**Quaker Oats** (Chicago, IL) **Major Brands:** Quaker cereals, Aunt Jemima, Gatorade, Ken-L ration, Kibbles 'n Bits, Fisher-Price toys	$111,460.60
24	**Ralston-Purina** (St. Louis, MO) **Major Brands:** Purina Chow, Lucky Dog, Savor, Alley Cat, Pro Plan, Chex cereals, Ghostbusters, Nerds, Wonder bread, Beefsteak bread, Hostess snacks, Yodels, Ring Ding Jr., Devil Dogs, Eveready, Energizer batteries	$108,994.41
25	**Kellogg** (Battle Creek, MI) **Major Brands:** Kellogg's cereals, Eggo, Pop-Tarts, Mrs. Smith's, Salada, Whitney's yogurt	$105,494.55
26	**PPG Industries, Inc.** (Pittsburgh, PA) **Major Brands:** Pittsburgh paint	$104,445.72
27	**Bristol-Myers** (New York, NY) **Major Brands:** Nuprin, Bufferin, Excedrin, Datril, Comtrex, Ban, Vitalis, No Doz, Windex, Drano, Vanish, O-Cedar, Endust, Clairol, Sea Breeze, PreSun, Alpha Keri, Enfamil	$100,007.25
28	**American Brands** (New York, NY) **Major Brands:** Jim Beam, Lucky Strike, Pall Mall, Carlton, Sunshine-Hydrox, Titleist, Jergens, Swingline, Master padlocks	$92,710.08

Rank	Company (location)	$ Spent on Packaging (thousands)
29	**General Mills** (Minneapolis, MN) **Major Brands:** Cheerios, Total, Wheaties, Lucky Charms, Betty Crocker, Gold Medal flour, Bisquick, Hamburger Helper, Pop Secret, Yoplait, Gorton's	$89,389.96
30	**Colgate-Palmolive** (New York, NY) **Major Brands:** Colgate, Palmolive, Ajax, Curity, Hill's pet products, Irish Spring	$87,381.52
31	**E.I. duPont de Nemours** (Wilmington, DE) **Major Brands:** Remington firearms	$86,762.40
32	**Chesebrough-Pond's** (Westport, CT) **Major Brands:** Vaseline, Prince Matchabelli, Aziza, Erno Laszlo, Ragu sauces, Q-tips, Cutex, Rave, Bass shoes, Prince sporting goods	$72,949.78
33	**CPC International** (Englewood Cliffs, NJ) **Major Brands:** Skippy, Mazola, Thomas', Knorr, Hellman's, Karo, Old London, Arnold bread, Best Foods, Argo corn starch	$72,043.10
34	**Westinghouse** (Pittsburgh, PA) **Major Brands:** Thermo King, Longines-Wittenauer watches, Royal Crown bottling	$70,119.39
35	**Dow Chemical** (Midland, MI) **Major Brands:** Cepacol, Saran Wrap, Handi-wrap, Ziploc, Fanta-stick, Spray 'n Wash, Yes	$57,396.00
36	**Pfizer Inc.** (New York, NY) **Major Brands:** Feldene, Procardia, Cefobid, Ben-Gay, Barbasol, Stetson fragrances	$52,540.38
37	**Eli Lilly** (Indianapolis, IN) **Major Brands:** Keflex, Nalfon, Ceclor, Rumensin, Monteban, Treflan, Elizabeth Arden cosmetics	$42,073.24
38	**General Motors** (Detroit, MI) **Major Brands:** G.M. parts	$40,097.34
39	**Merck & Co.** (Rahway, NJ) **Major Brands:** Vasotec, Primaxin, Noroxin, Pepcid, Ivermectin	$38,021.70

In addition to Miller beer and Marlboro cigarettes, the General Foods family of brands belong to No. 2 Giant, Philip Morris.

Brands consumers use every day make companies Packaging Giants.

With perhaps more famous brands than any other company, No. 3 giant Procter & Gamble has recently added the Richardson-Vicks products.

MELISSA LARSON
Senior Editor

"Working on this project has given us an opportunity to see the 'big picture'—to find out where packaging fits within the larger framework of American business and industry."

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card.

Outstanding	472
Above Average	473
Average	474
Below Average	475

Rank	Company (location)	$ Spent on Packaging (thousands)
40	North American Phillips (New York, NY) **Major Brands:** Norelco, Magnavox, Sylvania, Schick, Genie	$37,049.46
41	Whirlpool (Benton Harbor, MI) **Major Brands:** Whirlpool, Kenmore, Kitchenaid, Mastercraft, St. Charles	$35,949.43
42	Eastman Kodak (Rochester, NY) **Major Brands:** Kodak	$34,652.00
43	Baxter-Travenol Laboratories (Deerfield, IL) **Major Brands:** Carpentier-Edwards, V. Mueller	$34,164.00
44	Abbott Labs (North Chicago, IL) **Major Brands:** Pulmocare, Abbokinase, Erythrocin, Tranxene, Selsun Blue, Murine, Tronolane, Faultless	$32,761.00
45	SmithKline Beckman (Philadelphia, PA) **Major Brands:** Tagamet, Contac, Ecotrin, Sine-Off, Allergan	$32,591.60
46	Goodyear Tire & Rubber (Akron, OH) **Major Brands:** Goodyear	$31,763.59
47	International Business Machines (Armonk, NY) **Major Brands:** I.B.M.	$30,750.00
48	Emerson Electric (St. Louis, MO) **Major Brands:** In-Sink-erator, Skil tools	$28,380.30
49	Squibb Corp. (Princeton, NJ) **Major Brands:** Capoten, Azactam, Charles-of-the-Ritz cosmetics (sold at end of 1986)	$25,309.88
50	Gillette Co. (Boston, MA) **Major Brands:** Gillette, Good News, Dry Idea, White Rain, Paper-Mate, Flair, Liquid Paper, Braun appliances	$24,869.32

Statistics Tell Interesting Story

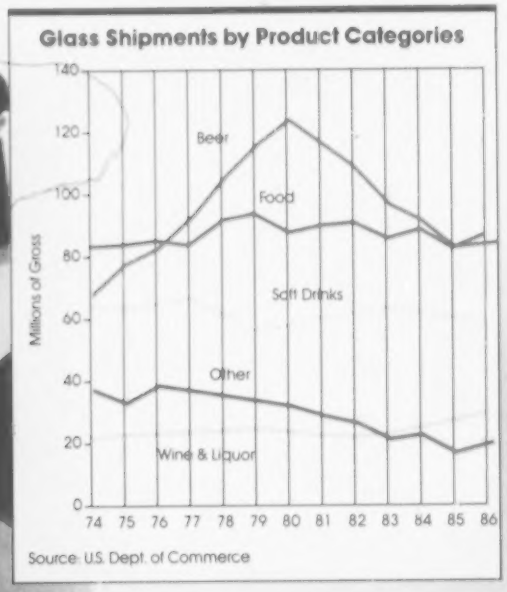
Glass really hasn't been hurt too much by plastic. The big culprit is aluminum.

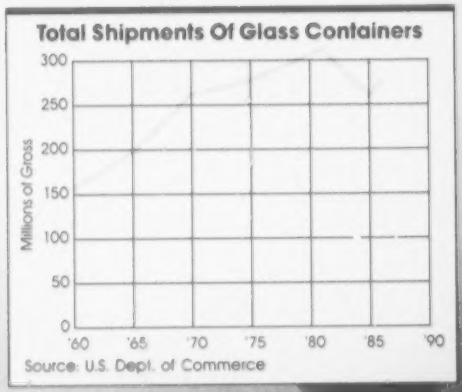
When the beer industry switched from glass bottles to aluminum cans in the early 1980s, the results were devastating to glass containers. For five consecutive years (1980-85), billions of glass beer bottles were replaced by aluminum cans.

Meanwhile, in a variety of other markets, glass was losing ground to plastic containers. But the losses in those other markets were nothing compared to the losses suffered by glass in the beer market.

As shown in the graphs below, shipments of glass containers plummeted by 5.8 billion containers during the period 1980-85. The beer industry accounted for 5.0 billion of those losses. In other words, over 85 per cent of the total decline for glass containers was due to the brewers switching to aluminum cans.

However, most people be-





Beer, once the darling of the glass industry, has stumbled. But it could be staging a comeback.

In 1986, glass usage was up 5%, the first increase in the decade of the '80s

lieve the opposite is true—that plastics are responsible for the losses suffered by glass. This perception is caused, in part, by all the publicity given to plastic containers. Every time a new plastic container is tested, it generates headlines. Beer switching from bottles to cans doesn't get much attention.

Glass is up

But the real story for the moment is the rebound for glass containers. In 1986, total shipments of glass containers were up about 5 per cent, and so far in 1987 that trend is continuing.

The new applications described on the previous pages are largely responsible for that increase. Also, the losses suffered in the beer industry have bottomed-out. In fact, glass also appears to be on the rebound in the beer industry. In 1986, beer in glass bottles grew 4.1 per cent compared with 1.2 per cent growth for beer in cans. Overall growth in the beer industry was 2.1 per cent with imports growing at a faster rate than domestic beer.

Imports, however, may face tough times in the future because of the weak dollar. There's a limit to the price people will pay for imported beer, and some industry experts think we are approaching that limit.

Imported beer accounts for roughly 1.5 billion bottles per year. That's an attractive market for domestic brewers who might be tempted to introduce new brands in an effort to capture the prestige, image, and flavor of imported beers.

Most of the imported beers are packaged in glass bottles made by foreign companies. So any intrusion into this market by domestic brewers would be important new business for domestic glass companies.

Ideas for soft drinks

Another big market for glass bottles is soft drinks. However, soft drink aisles in supermarkets are dominated by cans and two-liter plastic bottles. But an interesting test is underway in Chicago that could see glass bottles returning to the aisles.

As with many successful ideas, the Chicago concept is quite simple. Basically, it involves 12-packs of 16-ounce nonrefillable bottles. One important aspect of this new approach is the corrugated case, which is open at the top so consumers can see the bottles. Also, the case has die-cut carrying handles on the sides, permitting it to be lifted and carried easily.

The critical aspect, however, is cost. The 12-pack of bottles is priced about the same as cans. So far the concept has met with outstanding success in Chicago. Virtually every major bottler in the city is using it.

Another idea receiving enthusiastic acceptance is "bottle bins." These are huge wire bins containing bottles of soft drinks, which shoppers purchase individually. The bins have two purposes: (1) They permit consumers to try new flavors and brands by purchasing individual bottles; and (2) They stimulate impulse purchases.

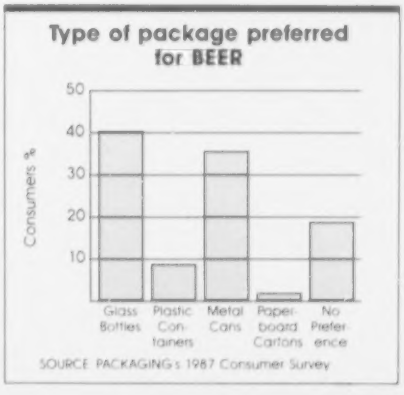
With so many new soft drinks on the market today, many people are hesitant to purchase six-packs or twelve-packs without first trying the product. Individual bottles in bins are proving to be a good way to permit "sampling."

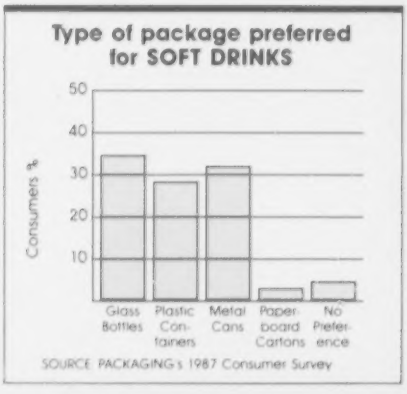
At the same time, bottle bins increase sales. After shoppers make their normal

GLASS SHIPMENTS (Thousands of Gross)

Type of Container	1986	1985	1984	1983	1982	1981	1980
Narrow Neck							
Food	27,737P	23,770	26,170	28,270	27,658	28,728	28,075
Medicinal and health supplies	15,907P	8,710	10,140	9,665	12,393	12,536	12,956
Chemical, household, and industrial		942	1,379	976	1,456	1,718	2,071
Toiletries and cosmetics		5,302	6,566	6,506	8,006	8,489	9,245
Beverage, refillable	62,093	1,553	2,100	3,383	3,729	4,138	4,571
Beverage, nonrefillable		58,532	59,475	59,234	57,291	56,110	53,277
Beer, refillable	87,601	1,870	3,473	2,475	1,899	1,570	1,869
Beer, nonrefillable		81,907	87,323	94,625	105,962	115,768	120,809
Liquor	10,873	11,939	14,015	14,712	13,757	15,365	15,790
Wine	17,157	14,036	10,414	8,916	8,408	8,638	8,784
TOTAL NARROW NECK	221,368	208,561	221,055	228,762	240,559	253,060	257,447
Wide Mouth							
Food	60,044	59,935	64,302	60,108	63,372	62,404	61,212
Medicinal and health	4,830P	2,715	3,150	2,995	3,097	3,274	3,084
Chemical, household, and industrial		1,015	988	812	1,159	1,122	1,191
Toiletries and cosmetics		595	455	426	659	820	965
TOTAL WIDE MOUTH	64,874	64,260	68,895	64,341	68,287	67,620	66,452
TOTAL (NARROW & WIDE MOUTH)	286,242	272,821	289,950	293,103	308,846	322,845	326,132

Source: U.S. Dept. of Commerce
P PACKAGING Estimates





INTRODUCING, THE NEW KID ON THE BLOCK WITH OVER 150 YEARS OF EXPERIENCE

Meet Ball-InCon Glass Packaging Corp., a brand-new producer of glass containers that hit the ground running on May 1, 1987, the day of its birth.

"How?" you say? Easy. Ball-InCon acquired the glass container assets of Ball Corporation and InCon Packaging, and with that, 150-plus years of combined experience in making glass containers.

No presents are requested for Ball-InCon's debut. Rather, Ball-InCon has something for *you*: 13 glass container manufacturing plants located coast to coast, a state-of-the-art glass container mould facility, flint, amber and green furnaces to meet your requirements and a commitment to providing the very best quality and service in the industry.

We're equipped and experienced in providing glass containers for food, wine, soft drinks, liquor, beer, cosmetics, pharmaceuticals and chemicals. We'll help you design a new container, or show you how one of ours can meet your needs.

Ball Glass Container Group has been a provider of quality glass food containers since 1882.

InCon Packaging has been producing quality food, beverage, liquor and wine containers since 1937.

You might have known us in the past as Ball, InCon Packaging, Laurens/Pierce or Northwestern. *Now* you can call us Ball-InCon.

Ball-InCon
Glass Packaging Corp.
P.O. Box 4200
Muncie, IN 47307-4200
(317) 741-7000

Ball-InCon

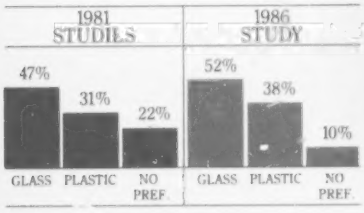
For information circle **65**

Consumer Preference Study:
Colas in 1½-oz. Glass &
Plastic Bottles
16 OZ.
MAY 15, 1967

Research proves once again that consumers prefer soft drinks in glass.

There's one thing that can be said with certainty about America's soft drink consumers–they're consistent.

A broad based study conducted recently by Oxtoby-Smith, a leading independent research company, confirmed a clear-cut consumer preference for colas in 16-oz. glass bottles versus 16-oz. plastic bottles. This preference for glass over plastic is consistent with the average of two studies conducted five years ago.



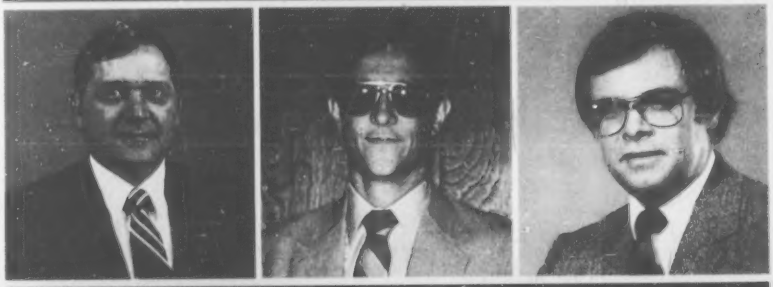
Regardless of whether the beverage was served with or without ice, from bottles or cups, with a straw or without, *males and females in all age groups preferred drinking colas from glass bottles*. And the strongest preferences for glass as a package were among the "heaviest users" of colas.

THE NATURAL PACKAGE PEOPLE NATURALLY PREFER.

This recent study simply reinforces what we've known for decades: People prefer glass. And the reasons are perfectly clear.

Glass projects a quality image with consumers. It also lets people see the beverages they're buying—and they like that. What's more, glass protects flavor without affecting taste.

GLASS IS A HOT PACKAGE WITH BOTTLERS



"We are pleased with the success of our 16-oz. glass package here at Denver Pepsi. Single service 16-oz. has opened up several markets for us. Our customers like single service glass packaging."

–Larry Ayres
Senior Vice President
Pepsi-Cola Bottling Co. of Denver
Denver, CO

"NR glass is a hot package. Right now we're seeing consumer preference shifting from refillables to NR's. For the first time, supermarkets are promoting glass."

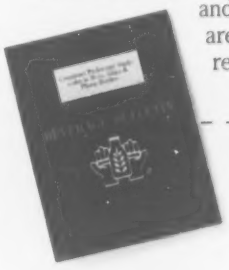
–James W. Bonebrake
VP Manufacturing
Kemmerer Bottling Group, Inc.
Joliet, IL

"Glass packaging has always been important to us. We have been very active with the 10- and 16-oz. single service glass packages. They showcase our product well."

–Donald R. Cameron
General Manager
Cameron Coca-Cola Bottling Co., Inc.
Pittsburgh, PA

GLASS IS MORE RECYCLABLE THAN EVER.

Glass recycling programs have been established across America, and more people are finding that recycling pays.



A significantly higher percentage of new glass bottles are being made from old bottles—and consumers are showing a growing appreciation for 100% recyclable glass.

For information circle **66**

This message is brought to you by the men and women who make glass containers. Naturally.

DISCOVER THE GLASS PREFERENCE FOR YOURSELF.

For a FREE report of the consumer research findings, complete and return this coupon.

Glass Recycles

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Send to: Glass Packaging Institute, 1133 20th St. NW, Suite 321, Washington, D.C. 20036

© 1986 by Glass Packaging Institute

Wine coolers, selling more than 3 million bottles per day, have pumped new life into glass container operations

soft drink selections as part of their shopping routine, they tend to make impulse purchases from well-placed bottle bins. One variation of the bottle bin is the vertical merchandising rack. Either way the results are the same —increased sales.

Consumers prefer glass

When asked whether they preferred glass bottles, metal cans, plastic bottles, or paperboard cartons for soft drinks, consumers said glass bottles. That question was asked as part of PACKAGING's 1987 Consumer Survey.

Glass bottles for soft drinks were preferred by 34.3 per cent of the respondents; metal cans were preferred by 30.5 per cent; plastic containers by 28.0 per cent; paperboard cartons by 2.1 per cent; and 5.1 per cent of the respondents had no preference. The two largest groups of consumers preferring glass containers were young singles (44.7 per cent) and older singles (42.6 per cent).

The same pattern between bottles and cans was seen when PACKAGING asked consumers about their preferences for beer packages. The answers were: 39.9 per cent for glass bottles; 34.1 per cent for metal cans; 7.2 per cent for plastic containers; and 1.0 per cent for paperboard cartons. However, unlike the responses for soft drinks, a whopping 18.2 per cent said they have no preference when it comes to beer packaging.

Earlier this year, the Glass Packaging Institute (GPI) sponsored a study comparing consumer preference for cola in 16-ounce glass bottles vs. 16-ounce plastic bottles. GPI is the trade association for the glass container industry. The study was conducted by Oxtoby-Smith, Inc., a New York-based research firm.

Results of the study showed 52 per cent of the consumers preferred cola in glass bottles, compared with 38 per cent who preferred plastic bottles. The remaining 10 per cent were undecided.

In the study, a total of 693 consumers—291 teenagers and 402 adults—were interviewed in shopping malls in the Northeast, Southeast, Midwest, Southwest, Mountain states and West Coast. Only those consumers who said they drink at least three 8-ounce glasses of cola per week and who said they regularly drink Coca-Cola Classic, Diet Coke, Pepsi-Cola or Diet Pepsi participated in the study.

Each respondent sampled the brand of cola they drink regularly. They were given two unopened 16-ounce single service bottles of the brand—one glass, one plastic. They opened the bottles and sampled the product in whichever way they wished —directly from the bottle, or in a paper cup, with or without a straw, and with or without ice. The cola in both bottles, however, was sampled the same way. After both bottles were sampled, the consumers were asked which they preferred.

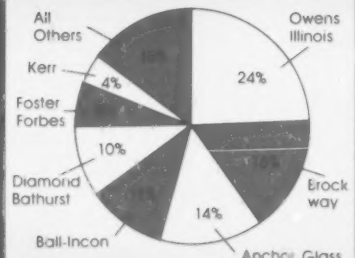
Wine coolers are positioned as a premium product and glass plays an important role in conveying that premium image. The phenomenal growth of wine coolers over the past few years is expected to level off. But the product has carved out a niche for itself and is predicted to be around for the long term. Wine coolers were a $1.7 billion market in 1986. Among the major companies marketing wine coolers are Gallo (Bartles & Jaymes), Seagram, Brown-Forman (California Cooler) and Sun Country. Each of those brands are planning to spend between $30 and $40 million for advertising this year. In addition, dozens of other companies are battling for market shares. The result will be an overwhelming amount of promotion.

Plants **Modernize,**

Capital Expenditures

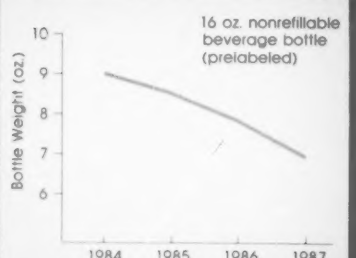
Anchor Glass: $40 million in 1986
Ball-Incon: $24 million in 1986
Brockway: $425 million since 1977
Diamond Bathurst: $40 million in 1986
Foster Forbes: $60 million over 5 years
Kerr: $25 million over past 3 years
Liberty Glass: $40 over past 5 years
Owens-Illinois: $80-90 million/year, avg.
Wheaton Glass: $10 million over 2 years

Estimated Market Share



Source: PACKAGING estimate

Advances in Lightweighting



Quality Improves

New molding machines make a big difference in producing stronger, lighter bottles.

An amazing transformation is taking place in glass container manufacturing, and new kinds of glass companies are emerging. These are the companies that survived the dramatic decline in usage of glass containers for five consecutive years (1980-1985).

Demand for glass containers plummeted 16% since 1980 and forced 31% of glass container production to shut down. As a result, companies underwent mergers, acquisitions, consolidations, leveraged buyouts, takeovers—and turmoil.

Industry consolidates

In 1980, twelve companies manufactured 70% of the glass containers used in the U.S. Today, five companies produce 75% of the containers.

The latest merger was between Ball Corporation and InCon Packaging. That move created a joint venture company, Ball-Incon Glass Packaging Corp., which in turn acquired the glass container businesses and assets of Ball Corp. and Incon Packaging. InCon itself was made up of Northwestern Glass, Laurens/Pierce Glass, Madera Glass, and the original, Indian Head Glass.

The joint venture, Ball-Incon, ranks as the leading producer of glass containers for the food industry and the fourth or fifth largest domestic supplier of glass containers. It has a 5,500-person work force and will have annual sales of $550 million.

Where the effort is

All glass container manufacturers, large and small, are investing millions of dollars in new equipment.

Much attention is being focused on forming, which is the heart of the glass operation. Here, considerable effort is being spent on obtaining uniform distribution of glass throughout the container. If glass is distributed more uniformly, the strength of the container is increased because weak spots (thin areas) are eliminated.

In addition, uniform distribution means less glass is needed to make the container. Thus, the container becomes lighter, and less costly. To top it off, production speeds are increased.

In particular, much work is taking place with "press and blow" technology for forming narrow-neck bottles. Rather than simply blowing the bottles, press-and-blow technology uses mechanical techniques to press the glass against the mold. This improves the distribution of glass within the bottles and increases production speeds. In addition to improved productivity, the result is stronger, lighter bottles.

Some companies, such as Owens-Illinois, have developed their own technology for press-and-blow molding. Also, Owens-Illinois has developed a first-of-its kind, "ten quad machine," which is said to be the fastest forming machine in the U.S. for glass containers. The machine has ten sections with four cavities per section. It operates at speeds well over 450 containers per minute.

Not to be outdone, American-National Can (Foster-Forbes) will install the USA's first 16-section machine later this year. The company also has two additional 16-section machines on order, and they are scheduled to be operational in early 1988. The 16-

Hundreds-of-millions of dollars are being pumped into glass plants

Computers control the glass furnaces, as well as many other operations, in today's modern glass container plants.

Finished bottles undergo a battery of on-line tests such as sidewall thickness inspection.

Seven companies produce 85% of the glass containers in the U.S.

section machine uses the press-and-blow technique developed by the Heye Glass Co. of West Germany, and the machine will produce in excess of 450 containers a minute. Foster-Forbes currently has 22 Heye lightweight bottle machines.

In one way or another, almost all glass companies are moving to press-and-blow technology, as well as to computerized control and electronic inspection of finished bottles.

In addition to investments in those areas, Brockway invests heavily in R&D for the actual molds. In fact, the company has its own metallurgical department which develops special mold alloys. On-going research with alloys is credited with giving Brockway an increase in productivity of 2 to 2-1/2 per cent per year since 1980.

Alloys are important because the temperature of molten glass is 2,300 degrees F. when it enters the mold. The trick is to turn this into a bottle and cool it quickly so that the bottle can support its own weight and be discharged from the mold. Obviously, the faster this can be done, the higher the productivity.

Huge investments

Over the past few years, huge sums of money have been invested to improve production of glass containers, and those investments are continuing. Owens-Illinois, for example, averages $80 to $90 million per year; Brockway spent $425 million since 1977, and so on.

Diamond Bathurst spent $40 million to improve its glass manufacturing equipment and facilities in 1986, and expects to spend another $40 million this year. During the past 15 months, the company rebuilt ten of its glass furnaces and renovated about 50% of its production capacity. This modernization program will continue for 1987.

Anchor Glass also spent $40 million in 1986 to improve its equipment and processes. The money was used to continue a program initiated in 1984 to replace smaller production machinery with larger, more efficient equipment. Also, the money was used to install sophisticated quality control equipment on all of the company's production lines.

Over the last 3 years, Kerr has invested in excess of $22 million for its four glass facilities. Capital improvements have been made throughout all manufacturing operations with substantial investments in computerized furnace control systems, high-productivity forming machines, and quality control equipment.

Ball-Incon spent $85 million over the past three years in its manufacturing operation.

Even the "small" companies are investing heavily. Wheaton Glass, for example, recently completed a $10 million investment in its glass-manufacturing operations for containers for the parenteral drug industry. Considerable sums have also been spent by Wheaton for improved equiment to produce glass containers for the cosmetics industry.

Liberty Glass, which has only one plant, spent $40 million over the past five years to make its plant "the most modern and best-equipped single-service beverage glass production plant in the world," according to the company.

The point is, *all* of the glass companies in business today are investing heavily in the future. PACKAGING's scorecard of investments by the companies is shown on the previous page.

WHERE THE GLASS PLANTS ARE

1 Anchor Glass
10 plants
Cliffwood, NJ
Connellsville, PA
Gurnee, IL
Henryetta, OK
Houston, TX
Jacksonville, FL
Salem, NJ
Shakoppe, MN
Warner Robins, GA
Winchester, IN
Headquarters
Tampa, FL

2 Anchor Hocking (Carr-Lowrey)
1 plant
Baltimore, MD
Headquarters
Lancaster, OH

3 Arkansas Glass Container Corp.
1 plant
Jonesboro, AR
Headquarters
Jonesboro, AR

4 Ball-Incon
13 plants
Ashville, NC
Carteret, NJ
Dalton, IL
El Monte, CA
Henderson, NC
Laurens, SC
Lincoln, IL
Madera, CA
Okmulgee, OK
Port Allegany, PA
Ruston, LA
Seattle, WA
Washington, PA
Headquarters
Muncie, IN

5 Brockway, Inc.
11 plants
Ada, OK
Brockway, PA
Crenshaw, PA
Danville, VA
Freehold, NJ
Lapel, IN
Montgomery, AL
Muskogee, OK
Oakland, CA
Pomona, CA
Zanesville, OH
Headquarters
Jacksonville, FL

6 **Central New York Bottling Co.**
1 plant
Auburn, NY
Headquarters
Auburn, NY

7 **Diamond-Bathurst, Inc.**
13 plants
Antioch, CA
Atlanta, GA
Chattanooga, TN
Corsicana, TX
Dayville, CT
Elmira, NY
Gulfport, MS
Hayward, CA
Keyser, WV
Lawrenceburg, IN
Royersford, PA
Streator, IL
Vernon, CA
Headquarters
Malvern, PA

8 **Columbine Glass (Coors)**
1 plant
Wheat Ridge, CO
Headquarters
Wheat Ridge, CO

9 **Foster-Forbes Glass Co. (American-National Can)**
8 plants
Burlington, WI
Marion, IN
Maywood, CA
Milford, MA
Millville, NJ
Pevely, MO
Waxahachie, TX
Wilson, NC
Headquarters
Marion, IN

10 **Gallo Glass**
1 plant
Modesto, CA
Headquarters
Modesto, CA

11 **Glenshaw Glass Co., Inc.**
1 plant
Glenshaw, PA
Headquarters
Glenshaw, PA

12 **Hillsboro Glass Co.**
1 plant
Hillsboro, IL
Headquarters
Hillsboro, IL

13 **Industrial Glass Co., Inc. (Tropicana)**
1 plant
Bradenton, FL
Headquarters
Bradenton, FL

14 **Kerr Glass Manufacturing Corp.**
4 plants
Dunkirk, IN
Plainfield, IL
Sand Springs, OK
Santa Ana, CA
Headquarters
Los Angeles, CA

15 **Latchford Glass**
2 plants
Huntington Park, CA
San Leandro, CA
Headquarters
Los Angeles, CA

16 **Leone Industries**
1 plant
Bridgeton, NJ
Headquarters
Bridgeton, NJ

17 **Liberty Glass Co.**
1 plant
Sapulpa, OK
Headquarters
Sapulpa, OK

18 **Owens-Illinois**
14 plants
Atlanta, GA
Charlotte, MI
Clarion, PA
Huntington, WV
Lakeland, FL
Los Angeles, CA
Oakland, CA
Portland, OR
Streator, IL
Toano, VA
Tracy, CA
Volney (Fulton), NY
Waco, TX
Winston-Salem, NC
Headquarters
Toledo, OH

19 **Wheaton Industries**
2 plants
Flat River, MO
Millville, NJ
Headquarters
Millville, NJ

CALIFORNIA'S NEW RECYCLING LAW

September 1, 1987
Sales reporting begins. All containers marked 1 cent.

October 1, 1987
Recycler collection reporting begins. First report due January 9, 1988; every 6 months thereafter.

November 1, 1988
Report on recycling progress and fund. New containers to be covered.

June 30, 1989
Fee increases to 2 cents per container for types of containers failing to achieve 65% redemption rate. Effective December 31, 1989.

June 30, 1992
Fee increases to 3 cents per container for types of containers failing to achieve 65% redemption. Effective December 31, 1992.

Why Consumers Like Recycling

Source: Carolinas Glass Recycling. Based on telephone survey of 1,399 households in North and South Carolina.

GLASS AVAILABLE FOR RECYCLING

How much glass is available for recycling in any given city? Here is an approximate guide, adapted from a newsletter of the Pennsylvania Glass Recycling Corp., and The Nickel Solution News.

% of Glass Recovered	ANNUAL GLASS RECOVERY (TONS)						
100%	50	250	500	1,250	2,500	5,000	25,000
90%	45	225	450	1,125	2,250	4,500	22,500
80%	40	200	400	1,000	2,000	4,000	20,000
70%	35	175	350	875	1,750	3,500	17,500
60%	30	150	300	750	1,500	3,000	15,000
50%	25	125	250	625	1,250	2,500	12,500
40%	20	100	200	500	1,000	2,000	10,000
30%	15	75	150	375	750	1,500	7,500
20%	10	50	100	250	500	1,000	5,000
10%	5	25	50	125	250	500	2,500
5%	2.5	12.5	25	62.5	125	250	1,250
	1,000	5,000	10,000	25,000	50,000	100,000	500,000
	POPULATION						

Glass can be recycled into new bottles over and over again.

Recycling: Big Issue for Future

Glass is an interesting product in that it is 100 per cent recyclable; it can be used over and over to make new glass containers. Accordingly, glass container manufacturers purchase used bottles, crush them into cullet and mix the cullet with sand, soda ash, and limestone to produce new bottles.

Currently, glass plants use about 20 to 30 per cent cullet in their operations. But they'd like to use much more. Recycled glass helps lower the cost of manufacturing new containers, in addition to helping solve the solid waste problem. Furthermore, glass recycling gives glass manufacturers a competitive edge over plastic. This could become especially critical in the future as new laws take hold.

New California law

One of the important new recycling laws passed recently is California's "Assembly Bill 2020," which penalizes containers failing to achieve a 65 per cent redemption rate in California.

Specifically, the new law requires a minimum redemption value of one cent on every glass, aluminum and plastic container for soft drinks, beer and other "covered" beverages sold in California after September 1, 1987. This redemption value increases to two cents for containers failing to achieve a 65 per cent redemption rate by December 31, 1989. Then it increases to three cents for those containers failing to achieve the 65 per cent redemption rate by December 31, 1992.

Beverage distributors pay the redemption value which is placed into a special fund administered by the California Department of Conservation. The money collected is used to help develop recycling.

NJ passes law

In April, New Jersey Governor Kean signed a bill to make recycling a basic and permanent element of the state's solid waste management strategy. Basically, the bill mandates source separation of at least three recyclable items from materials that include glass, plastic, aluminum, and newspaper.

The New Jersey law is significant because it addresses all recyclables—not just beverage containers. The first year the program is enacted, municipalities are expected to reduce the previous year's total municipal solid waste by 15 per cent. The second year, the percentage increases to 25 per cent.

Each municipality must adopt an ordinance mandating that all residents, business and institutions source separate the specified materials for collection and recycling. However, ordinances will not be passed until markets have been developed for the recycled materials.

New laws in California and New Jersey could have tremendous impact

Igloos are an attractive and convenient way to encourage glass recycling. Premiering in California, the igloos are designed for use in high traffic areas such as shopping centers. They are used in tandem, one for clear glass and one for colored.